

# applied surface science

## Contents

Volumes 238 (2004) Nos. 1–4

### Preface

Scanning probe microscopy experiments in micro-gravity

T. Drobek, M. Reiter and W.M. Heckl

Some geometrical considerations about the influence of topography on the adhesion force as measured by AFM on curved surfaces

A. Méndez-Vilas, M.L. González-Martín and M.J. Nuevo

Determination of uptake rate of sensitive diffusion sampler for formaldehyde in air

Y. Sekine, D. Oikawa and M. Butsugan

Surface characterisation of two strains of *Staphylococcus epidermidis* with different slime-production by AFM

A. Méndez-Vilas, A.M. Gallardo-Moreno, M.L. González-Martín, R. Calzado-Montero, M.J. Nuevo, J.M. Bruque and C. Pérez-Giraldo

Topography induced by sputtering in a magnetic sector instrument: an AFM and SEM study

E. Jacob, M. Bersani, A. Lui, D. Giubertoni, M. Barozzi and M. Anderle

Scanning tunneling microscopy of titanium silicide nanoislands

I. Goldfarb, S. Grossman, G. Cohen-Taguri and M. Levinshtein

Missing dimer defect on  $\beta$ -SiC(001)-c( $2 \times 2$ ) surface—numerical analysis of the structure and STM profiles

B. Stankiewicz, W. Kamiński and L. Jurczyszyn

Artifacts in AFM images revealed using friction maps

A. Méndez-Vilas, M.L. González-Martín, L. Labajos-Broncano and M.J. Nuevo

Force spectroscopy of covalent bond rupture versus protein extraction

R. Afrin, S. Okazaki and A. Ikai

Direct surface probing of cell wall-defective mutants of *Saccharomyces cerevisiae* by atomic force microscopy

A. Méndez-Vilas, I. Corbacho, M.L. González-Martín and M.J. Nuevo

Domain size effects on the thermal properties of PS/PMMA blends

G.G. Silva, P.M. de Freitas Rocha, P.S. de Oliveira and B.R. Almeida Neves

1 The dynamics of  $H_2$  and  $N_2$  sorption in carbon nanotubes

Zs. Ötvös, Gy. Onyestyák, J. Vályon, I. Kiricsi, Z. Kónya and L.V.C. Rees

3 The effect of promoters on the electronic structure of ruthenium catalysts supported on carbon

M. Guraya, S. Sprenger, W. Rarog-Pilecka, D. Szmigiel, Z. Kowalczyk and M. Muhler

9 Adsorption of Pd atoms on  $\gamma$ - $Al_2O_3$ : a density functional study of metal-support interactions

A.M. Márquez and J.F. Sanz

14 Ethanol pretreatment effect and particle diameter issues on the adsorption of *Candida rugosa* lipase onto polypropylene powder

M. Laura Foresti and M. Luján Ferreira

18 An intermittent temperature-programmed desorption method for studying kinetics of desorption from heterogeneous surfaces

F. Gaillard, M. Abdat, J.P. Joly and A. Perrard

24 The effect of ultrasound on the catalytic activity of alkaline carbons: preparation of *N*-alkyl imidazoles

C.J. Durán-Valle, S. Ferrera-Escudero, V. Calvino-Casilda, J. Díaz-Terán and R.M. Martín-Aranda

29 Adsorption of polyelectrolyte multilayers on plasma-modified porous polyethylene

G. Greene and R. Tannenbaum

36 Analyses of thin films and surfaces by cold neutron depth profiling

G.P. Lamaze, H.H. Chen-Mayer and K.K. Soni

42 Ion beam processing of magnesium oxide thin films for PDP application

H. Nomura, S. Murakami, A. Ide-Ektessabi, Y. Tanaka and Y. Tsukuda

47 Erbium-doped thin amorphous carbon films prepared by mixed CVD sputtering

G. Speranza, L. Calliari, M. Ferrari, A. Chiasera, K. Tran Ngoc, A.M. Baranov, V.V. Sleptsov, A.A. Nefedov, A.E. Varfolomeev and S.S. Fanchenko

51 Dry laser cleaning of mechanically thin films

F. Bloisi, A.C. Barone and L. Vicari

64 Microstructure and bactericidal ability of photocatalytic  $TiO_2$  thin films prepared by rf helicon magnetron sputtering

L. Miao, S. Tanemura, Y. Kondo, M. Iwata, S. Toh and K. Kaneko

(Contents continued on page XVII)



0169-4332(20041115)238:1-4;1-X



(Continued from outside back cover)

Silver nanoparticle formation in thin oxide layer on silicon by silver-negative-ion implantation for Coulomb blockade at room temperature H. Tsuji, N. Arai, T. Matsumoto, K. Ueno, Y. Gotoh, K. Adachi, H. Kotaki and J. Ishikawa	132
Spectromicroscopy of ultrathin Pd films on W(1 1 0): interplay of morphology and electronic structure L. Aballe, A. Barinov, A. Locatelli, S. Heun, S. Cherifi and M. Kiskinova	138
Equilibrium and non-equilibrium 1/f noise in AlGaIn/GaN TLM structures S.A. Vitusevich, S.V. Danylyuk, M.V. Petrychuk, O.A. Antoniuk, N. Klein and A.E. Belyaev	143
Study of GaN <sub>x</sub> As <sub>1-x</sub> semiconducting films grown by laser pulsed deposition on crystalline and amorphous substrates J.A. Cardona-Bedoya, A. Cruz-Orea, J.G. Mendoza-Alvarez, M. Lucero Gomez-Herrera, M.H. Farias and J.A. Diaz	147
Electron inelastic mean free paths and surface excitation parameters for GaAs C.M. Kwei and Y.C. Li	151
Ni-Mn-Ga films on Si, GaAs and Ni-Mn-Ga single crystals by pulsed laser deposition A. Hakola, O. Heczko, A. Jaakkola, T. Kajava and K. Ullakko	155
Ion beam synthesis of 3C-SiC layers in Si and its application in buffer layer for GaN epitaxial growth Y. Ito, T. Yamauchi, A. Yamamoto, M. Sasase, S. Nishio, K. Yasuda and Y. Ishigami	159
Crystallization kinetics of hydrogenated amorphous silicon thick films grown by plasma-enhanced chemical vapour deposition J. Farjas, C. Rath, P. Roura and P. Roca i Cabarrocas	165
SEM and HRTEM study of porous silicon—relationship between fabrication, morphology and optical properties J. Dian, A. Macek, D. Nižňanský, I. Němec, V. Vrkošlav, T. Chvojka and I. Jelínek	169
Heating-sol-gel template process for the growth of TiO <sub>2</sub> nanorods with rutile and anatase structure L. Miao, S. Tanemura, S. Toh, K. Kaneko and M. Tanemura	175
Structural and morphological properties of Cu(In, Ga)Se <sub>2</sub> thin films on Mo substrate R. Caballero and C. Guillén	180
Characterization of copper selenide thin films deposited by chemical bath deposition technique Al-Mamun and A.B.M.O. Islam	184
Homo-epitaxial growth of rutile TiO <sub>2</sub> film on step and terrace structured substrate Y. Yamamoto, Y. Matsumoto and H. Koinuma	189
Effect of UV irradiations on the structural and optical features of porous silicon: application in silicon solar cells S. Aouida, M. Saadoun, M.F. Boujmil, M. Ben Rabha and B. Bessaïs	193
Silicon dissolution regimes from chemical vapour etching: from porous structures to silicon grooving Ben Jaballah A., M. Saadoun, M. Hajji, H. Ezzaouia and B. Bessaïs	199
Quantum Hall effect devices based on AlGaAs/GaAs structures studied by photorefectance spectroscopy L. Zamora-Peredo, M. López-López, Z. Rivera, A. Guillén, A.G. Rodríguez-Vázquez, G. Ramírez-Flores, A. Lastras-Martínez and V.H. Méndez-García	204
Energy transfer in PbS quantum dots assemblies measured by means of spatially resolved photoluminescence N.O. Dantas, A.F.G. Monte, F. Qu, R.S. Silva and P.C. Morais	209
Polaronic states in II-VI quantum dot M. Triki and S. Jaziri	213
Deposition of phospholipid layers on SiO <sub>2</sub> surface modified by alkyl-SAM islands R. Tero, M. Takizawa, Y.J. Li, M. Yamazaki and T. Urisu	218
Molecular dynamics simulation of Cu cluster deposition on Au(0 0 1) surfaces J.C. Jiménez-Sáez, A.M.C. Pérez-Martín and J.J. Jiménez-Rodríguez	223
First principles simulations of Cu and Au deposition on $\alpha$ -Al <sub>2</sub> O <sub>3</sub> (0 0 1) surface N. Cruz Hernández and J.F. Sanz	228

In situ GISAXS study of the growth of Pd on MgO(0 0 1) F. Leroy, C. Revenant, G. Renaud and R. Lazzari	233
Deposition of 10-undecenoic acid self-assembled layers on H-Si(1 1 1) surfaces studied with AFM and FT-IR Y.J. Li, R. Tero, T. Nagasawa, T. Nagata and T. Urisu	238
Numerical simulation of surface deformation and residual stresses fields in laser shock processing experiments J.L. Ocaña, M. Morales, C. Molpeceres and J. Torres	242
Deformation behaviour induced by point defects near a Cu(0 0 1) surface M. Said-Ettaoussi, J.C. Jimenez-Saez, A.M.C. Perez-Martin and J.J. Jimenez-Rodriguez	249
Study of interfacial properties and its effect on magnetization behaviour of Fe/Ni multilayer structure R. Gupta, A. Gupta, S.M. Chaudhari, M. Gupta and P. Allenspach	254
Structure and interface properties of Mo/B <sub>4</sub> C/Si multilayers deposited by rf-magnetron sputtering A. Patelli, J. Ravagnan, V. Rigato, G. Salmaso, D. Silvestrini, E. Bontempi and L.E. Depero	262
Membrane surface modification and characterization by X-ray photoelectron spectroscopy, atomic force microscopy and contact angle measurements M. Khayet	269
Variability between chitosan membrane surface characteristics as function of its composition and environmental conditions A. Larena and D.A. Cáceres	273
Advanced generation of green conversion coatings for aluminium alloys M. Bethencourt, F.J. Botana, M.J. Cano and M. Marcos	278
Organization of copper-phthalocyanine molecules on mono-molecular organic buffer layers D. Takajo, T. Nemoto, H. Ozaki, Y. Mazaki and S. Isoda	282
Microstructure and mechanical properties of ceramic coatings on Ti and Ti-based alloy B. Surowska, J. Bieniaś, M. Walczak, K. Sangwal and A. Stoch	288
Molecular-scale structure fabrication at liquid/solid interfaces D. Takajo, T. Nemoto, H. Kurata and S. Isoda	295
Spontaneous aggregation of lipids in supported membranes with geometrical barriers T.-Y. Yoon, C. Jeong, J.H. Kim, M.C. Choi, M.W. Kim and S.-D. Lee	299
High value carbon materials from PET recycling J.B. Parra, C.O. Ania, A. Arenillas, F. Rubiera and J.J. Pis	304
Porous texture of activated carbons prepared by phosphoric acid activation of woods M.A. Díaz-Díez, V. Gómez-Serrano, C. Fernández González, E.M. Cuerda-Correa and A. Macías-García	309
Synthesis and application of hydroxyapatite/polylactide composite biomaterial N. Ignjatovic and D. Uskokovic	314
Synthesis and characterization of lanthanum incorporated mesoporous molecular sieves C. Pesquera, F. González, C. Blanco and L. Sanchez	320
3D imprint technology using substrate voltage change J. Taniguchi, M. Iida, T. Miyazawa, I. Miyamoto and K. Shinoda	324
Polycrystalline SiC growth and characterization C. Ricciardi, E. Aimo Boot, F. Giorgis, P. Mandracchi, U.M. Meotto and G. Barucca	331
Plasma-assisted SiC oxidation for power device fabrication P. Mandracchi, S. Ferrero, S. Porro, C. Ricciardi, G. Richieri and L. Scaltrito	336
Evaluation and quantification of reprocessing modification in single-use devices in interventional cardiology F. Tessarolo, P. Ferrari, B. Silvia, A. Motta, C. Migliaresi, L. Zennaro, A. Rigo, G.M. Guarrera and G. Nollo	341
Preparation of activated carbons from bituminous coal pitches J. Gañan, C.M. González-García, J.F. González, E. Sabio, A. Macías-García and M.A. Díaz-Díez	347

Well-aligned Co-filled carbon nanotubes: preparation and magnetic properties R. Kozhuharova, M. Ritschel, D. Elefant, A. Graff, A. Leonhardt, I. Mönch, T. Mühl, S. Groudeva-Zotova and C.M. Schneider	355
Optical properties of metal and semiconductor SmS thin films fabricated by rf/dc dual magnetron sputtering S. Tanemura, L. Miao, S. Koide, Y. Mori, P. Jin, A. Terai and N. Nabatova-Gabain	360
Optical and structural properties of amorphous silicon-carbon films for optoelectronic applications T. Stapinski, B. Swatowska, S. Kluska and E. Walasek	367
Comparison between optical techniques and confocal microscopy for defect detection on thin wires P. Siegmann, L.M. Sanchez-Brea, J.C. Martinez-Anton and E. Bernabeu	375
Optical characterization of surfaces by robust reflectance determination based on air-gap interference J.C. Martinez-Antón, J.A. Quiroga, R. González-Moreno and E. Bernabeu	380
Determination of surface anchoring energies of liquid crystals by optical diffraction C.-J. Yu, J.-H. Park and S.-D. Lee	385
Isomeric states of polar molecules on ionic surfaces: electrostatic model and FTIR studies P.Yu. Storozhev, V.S. Yanko, A.A. Tsyganenko, G. Turnes Palomino, M. Rodríguez Delgado and C. Otero Areán	390
Infrared characterization of strontium titanate thin films B.G. Almeida, A. Pietka and J.A. Mendes	395
Photoluminescence studies in highly Te-doped $\text{Ga}_{1-x}\text{In}_x\text{As}_y\text{Sb}_{1-y}$ epitaxial layers grown on GaSb by liquid phase epitaxy J. Diaz-Reyes, J.L. Herrera-Perez, M.L. Gomez-Herrera, J.A. Cardona-Bedoya and J.G. Mendoza-Alvarez	400
Physical characteristics and photoluminescence properties of phosphorous-implanted ZnO thin films C.-C. Lin, S.-Y. Chen and S.-Y. Cheng	405
Mesoscopic modelling of the interaction of infrared lasers with composite materials: an application to human dental enamel A. Vila Verde, M.M.D. Ramos, M. Stoneham and R. Mendes Ribeiro	410
Effect of radiation and thermal treatment on structural and transport parameters for cellulose regenerated membranes M.I. Vázquez, P. Galán, J. Casado, M.J. Ariza and J. Benavente	415
Registration of heavy metal ions and pesticides with ATR planar waveguide enzyme sensors A. Nabok, S. Haron and A. Ray	423
Interfacial microstructure and electrical properties of PT/ $\text{Al}_2\text{O}_3$ /Si annealed at high temperatures S.-Y. Chen, C.-S. Hsiao and J.-J. Hsu	429
Characterization of pulsed plasma-ion streams emitted from RPI-type devices applied for material engineering M.J. Sadowski, J. Baranowski, E. Skladnik-Sadowska, V.N. Borisko, O.V. Byrka, V.I. Tereshin and A.V. Tsarenko	433
Effect of molecular properties on the performance of polymer light-emitting diodes M.M.D. Ramos, A.M. Almeida, H.M.G. Correia, R. Mendes Ribeiro and A.M. Stoneham	438
Morphological change of polycrystalline copper after ion irradiation followed by annealing T. Hino, T. Taguchi, Y. Yamauchi, Y. Hirohata and M. Nishikawa	444
Singular points of electrochemical impedance function J.J. García-Jareño, D. Giménez-Romero and F. Vicente	449
Ab initio calculations of the $\text{LaMnO}_3$ surface properties R.A. Evarestov, E.A. Kotomin, D. Fuks, J. Felsteiner and J. Maier	457
Surface segregation phenomena of solute elements in Al-Pb and Al-Fe dilute binary alloys H. Tsubakino, A. Nogami, Y. Yamamoto, A. Yamamoto, M. Terasawa, T. Mitamura, A. Kinomura and Y. Horino	464
Characterisation of YAG:Ce powders thermal treated at different temperatures G. Del Rosario, S. Ohara, L. Mancic and O. Milosevic	469

Physical and rheological properties of petroleum fluids under the radio-frequency electromagnetic field effect and perspectives of technological solutions L.A. Kovalyova and A.M. Khaydar	475
A new drop-shape methodology for surface tension measurement M.G. Cabezas, A. Bateni, J.M. Montanero and A.W. Neumann	480
Characterization of silicon-YBCO buffered multilayers grown by sputtering A. Chiodoni, V. Ballarini, D. Botta, C. Camerlingo, F. Fabbri, S. Ferrari, R. Gerbaldo, G. Ghigo, L. Gozzelino, F. Laviano, B. Minetti, C.F. Pirri, G. Tallarida, E. Tresso and E. Mezzetti	485
Manipulation and conductivity measurements of gold nanowires M. Wilms, J. Conrad, K. Vasilev, M. Kreiter and G. Wegner	490
Characterization of a new sensing device based on hydrocarbon groups ( $\text{CH}_x$ ) coated porous silicon H. Cheraga, S. Belhousse and N. Gabouze	495
Experimental assessment of the influence of irradiation parameters on surface deformation and residual stresses in laser shock processed metallic alloys J.L. Ocaña, C. Molpeceres, J.A. Porro, G. Gómez and M. Morales	501
Metal-ceramic interfaces: joining silicon nitride-stainless steel R. Polanco, A. De Pablos, P. Miranzo and M.I. Osendi	506
Multifractal analysis of growing surfaces A. Chaudhari, C.-C. Sanders Yan and S.-L. Lee	513
Release of a chitosan-hydroxyapatite composite loaded with ibuprofen and acetyl-salicylic acid submitted to different sterilization treatments A. Larena, D.A. Cáceres, C. Vicario and A. Fuentes	518
Interfacial interactions of structural adhesive components with cement pastes. Studies by inverse gas chromatography (IGC) I. Baeta Neves, M. Chabut, C. Perruchot, M.M. Chehimi and K. Benzarti	523
Use of different surface analysis techniques for the study of the photo-degradation of a polymeric matrix composite A. Larena and S. Jimenez de Ochoa	530
Author Index	I
Subject Index	VIII



